mid-sized to large business end-users,[6] carriers using high capacity transport facilities, and resellers. Services provided over lower-capacity facilities are not in the same product market and are not encompassed by the U S WEST petition: in terms of the familiar standard of the *Merger Guidelines*, customers of these services would not shift their demands to high capacity facilities in response to a "small but significant" increase in the price of their current services, because the monthly cost of hooking them up for that kind of access is as much as six to seven times their current basic monthly charges.[7] Because, for this reason, high-capacity access to large users and low-capacity access to small users are not substitutable on the demand side, the smaller users are in a separate product market.[8]

In terms of supply substitutability, the market clearly embraces all local exchange companies, incumbent and competitive, as well as competitive access providers. There seems no reason to doubt that all of them are capable of providing service to the high-capacity market.

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[5] Over ten years ago, one of us applied a similar analysis to conclude that high capacity services were competitive in New York City. J.A. Hausman, T.J. Tardiff, and H. Ware, "Competition in Telecommunications for Large Users in New York," in National Economic Research Associates, *Telecommunications in a Competitive Environment,* Proceeding of the Third Biennial Telecommunications Conference, Scottsdale, Arizona, April 1989, pp. 1-19. Our study was based on testimony presented to the New York Public Service Commission. At the conclusion of that case, the Commission ordered that, with the implementation of collocation and the unbundling of switching and transport, New York Telephone be granted a wide range of pricing flexibility—the ability to raise rates by 25 percent annually and to lower them to incremental cost—for its high capacity dedicated services. New York Public Service Commission, Proceeding on Motion of the Commission to Review Regulatory Policies for Segments of the Telecommunications Industry Subject to Competition, Case 29469, Opinion No. 89-12, May 16, 1989. While New York was the first city in which local exchange competition took root, competition is more prevalent in Phoenix today than it was in New York when we performed our study.

[6] For ultimate customers, the distinction between mid to large businesses and smaller users corresponds roughly to locations with enough demand to justify a PBX.

[7] U S WEST's current price for a DS-1 facility is about $270 per month.

[8] *Horizontal Merger Guidelines,* Section 1.11.

A practical delineation of the geographic scope of the market for high capacity facilities from the supply side is the metropolitan area. New entrants often announce the availability of their services on this basis. In addition, this tends to be the area within which a provider can expand in a timely fashion to offer services to a growing number of locations. For this particular examination, POWER Engineers (PEI) have shown that competitive local exchange carriers in Phoenix can economically expand to serve almost half of the locations of U S WEST's present high-capacity customers within two years.[9]

B. Market Power Assessment

In this section, we undertake the four assessments performed by the FCC.

1. Market Share

According to Quality Strategies,[10] five competitive providers,[11] all of them with regional or national presence, have entered the high-capacity market in Phoenix since 1994—MFS-WorldCom, TCG, ELI, GST, and MCIMetro. MFS and TCG are the oldest and largest CLECs in the country. With its proposed merger with MCI, MFS-Worldcom would become affiliated

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[9] POWER Engineers, *Phoenix Fiber Study*, Prepared for U S WEST, August 13, 1998. Specifically, PEI estimated the cost of expanding CLEC networks to serve all U S WEST locations within 9,000 feet of those networks. These locations account for approximately 95% of all U S WEST's current high capacity demand in the Phoenix area.

Demand tends likewise to be location-specific. Although the size of the consumer base in the several metropolitan areas of the country (indeed, the world) tends to be responsive to, among other things, the availability and cost of high-tech telecommunications facilities, we would not contend that this source of demand elasticity at any particular location sufficiently constrains possible monopoly power at that location to justify broadening the definition of the market to include suppliers of comparable services elsewhere: we accept the obligation to demonstrate that competitive sources of supply must be sufficiently available, both actually and potentially, in Phoenix itself to justify our support for the U S WEST petition.

[10] High-Capacity Market Study—Phoenix MSA, Prepared for U S WEST, August 7, 1998.

with the second largest long-distance carrier. Similarly, AT&T recently completed its acquisition of TCG, the second largest national CLEC. These transactions involve the merger of the purchasers of approximately half of U S WEST's high capacity services (e.g., carriers purchasing access) in Phoenix with suppliers that compete directly with U S WEST. It would be difficult to conceive of a more substantial consequent diminution of whatever market power that company might previously have enjoyed.

The Quality Strategies report measured market share in a number of ways.[12] In terms of overall high capacity services, U S WEST provides 77 percent of total facilities—whether directly to customers or to other carriers—CLECs the other 23 percent. U S WEST's share is lower than that for facilities provided to end users (72 percent), but higher for IXC transport (84 percent).

What these still-high market shares conceal is the fact that competitors of U S WEST have already taken over the preponderant share of the retail market—both using U S WEST's facilities and, as we will point out, increasingly using their own. In terms of direct sales to retail end users, U S WEST's share of the high-capacity market is below 30 percent, according to this same study.[13]

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[11] For purposes of our discussion, we do not distinguish between competitive local exchange carriers (CLECs) and competitive access providers (CAPs).

[12] Unless otherwise indicated, its estimates are for the fourth quarter of 1997.

[13] A large proportion of U S WEST's high-capacity facilities are provided to other carriers, who then resell the capacity to end use customers. For example, interexchange carriers, such as AT&T, MCI and Sprint, use U S WEST special access facilities when providing certain services to their high-volume customers.

In addition to the level of the current market share of competitive providers, recent changes in that share as well as growth in the market overall[14] are germane to the assessment of market power. Both of these strongly suggest that the Phoenix high capacity market is increasingly competitive. The market overall has been growing recently at about 13 percent annually.[15] Expansion of the CLECs' business has been even more rapid. During the period from the fourth quarter of 1994 to the fourth quarter of 1997, their share of facilities provided to end users increased from 6 percent to 28 percent; and their share of total transport carriage has grown much more dramatically—from 5 to 16 percent in the half-year between the second and fourth quarters of 1997.[16] This means, as a matter of simple arithmetic, that their shares in the *incremental* business in this rapidly growing market must have been much greater than that. According to the Quality Strategies report (p. 15), CLEC facilities are getting 54 percent of the growth in demand of end-users (whether directly or through a reseller), and they are providing 42 percent of the growth in transport with their own facilities.

The strong recent growth in CLEC sales and market share is likely to continue and may even accelerate. While we do not have Company-specific data for Phoenix, CLECs expect to more than double their sales nationally in 1998, with the bulk targeted, as heretofore, at

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[14] In general, the more rapidly a market is growing, the easier entry is likely to be, other factors being equal. See, for example, G.J. Stigler, *The Theory of Price*, Fourth Edition, New York: McMillan, 1987, pp. 209-210.

[15] This rate of growth would produce a doubling of demand in about 5½ years.

[16] These growing shares in a growing market of course imply an even higher growth rate for CLEC volumes. CLEC circuits provided to end users grew by about one-third during 1997, while the CLEC transport volume *almost tripled* in the last half of 1997.

business customers. In fact, during the first quarter of 1998, CLECs added absolutely more new business lines in the U.S. than the RBOCs.[17]

A comparison of the Phoenix market share information with the situation the FCC considered when it granted AT&T nondominant status for interstate long-distance is informative. The FCC reported a market share of about 60 percent for AT&T in 1993.[18] Over the previous five years it had fallen by fewer than 10 percentage points.[19] While AT&T's revenues were essentially flat over the 1988 to 1993 period, the overall market was growing by about 5 percent per year and the revenues for carriers other than AT&T at about 15 percent annually.[20]

This comparison of markets at the time of their respective nondominance investigations thus reveals that while U S WEST's current market share at the wholesale, facilities level is higher than AT&T's at the time when the FCC found it non-dominant, its share at the retail level is much much lower: we doubt there would be economists prepared to refer to a firm with 30 percent of a retail market as "dominant." Moreover, at both wholesale and retail levels, the shares and the volumes of business of U S WEST competitors are growing at a considerably more rapid rate than were those of AT&T's competitors at that time. Since we believe the consensus of economic opinion would be to place greater emphasis on changes in market shares over time and shares in incremental business than their absolute levels, we believe the

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[17] See statement of Heather Gold, *FCC En Banc on State of Local Competition*, January 29, 1998 and Salomon Smith Barney "CLECs Surpass Bells in Net Business Line Additions for the First Time," May 6, 1998.

[18] AT&T nondominance order, par. 40.

[19] Federal Communications Commission, *Trends in Telephone Service*, February 1998, Table 11.1.

[20] *Ibid.*, Table 11.6.

consensus conclusion would be that U S WEST has much the stronger of the two cases for its claim of a lack of market power in the Phoenix high capacity market.

In fact, market shares considerably smaller than that of the CLECs in Phoenix have been considered competitively significant. For example, in its AT&T nondominance order, the FCC adduced in support of its conclusion (par. 62) the fact that long-distance resellers, with a market share of about 12 percent, could attract new customers sufficiently to constrain AT&T's ability to charge supracompetitive prices. Hubbard and Lehr go even further in concluding that these resellers had sufficient market presence to discipline AT&T, MCI and Sprint, combined.[21] Of course, the 1996 Telecommunications Act explicitly promotes this form of competition via its mandatory unbundling and resale provisions.

2. Demand Elasticity

In granting nondominant status to AT&T, the FCC observed that the demands of business customers are highly elastic, because they are sophisticated buyers who typically receive and consider alternative proposals from several vendors.[22] That observation clearly applies at least equally to the segment of the business customer market that purchases high capacity services and facilities—medium to large businesses and other carriers.

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[21] Affidavit of R. Glenn Hubbard and William H. Lehr, on behalf of Western Electric Company, Inc., and American Telephone and Telegraph Company, United States District Court for the District of Columbia, Civ. No. 82-0192 (HHG), filed December 5, 1994, Attachment 1: "An Analysis of Competition in U.S. Long-Distance Telephone Service," pp. 5-6. While we have disagreed with Hubbard and Lehr about the adequacy of competition in the long-distance business in protecting small residential purchasers of long-distance services, we have not disagreed at all about the effectiveness of competition in serving large customers and in appraising the role of resellers in that competition.

[22] AT&T nondominance order, par. 65.

In support of its motion for nondominant status, AT&T submitted an assessment by Professor Michael Porter of the competitiveness of the long-distance market.[23] He found that business customers have considerable negotiating power because of their sophisticated knowledge of telecommunications, their use of network outsourcers and their ability to provide their own networks. These factors are even more powerful in the case of high capacity services, because among the primary users of these services are other carriers that have both the incentive and the ability to drive a hard bargain for good prices and service by threatening to go elsewhere. One need look no further than the alliances between the major IXCs and CLECs (such as Worldcom/MCI/MFS, AT&T and TCG) to observe the ability of these buyers to seek good deals and/or self-provide by shifting their patronage to their affiliated CLECs.[24]

These factors are further reinforced by the already large share of U S WEST's competitors in the *retail* market. It means that even though they rely heavily on U S WEST actually to provide the high capacity facilities that they then resell to ultimate customers, they are not in this market handicapped by the typical inertia of residential customers, their reluctance to drop their familiar, historical supplier and shift to an unfamiliar retail competitor.

As for the elasticity of substitution between the offerings of U S WEST and its challengers, the rapid growth in the latter companies' share of the business speaks eloquently in

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[23] Michael E. Porter, "Competition in the Long-Distance Telecommunications Market," September 1993. The AT&T nondominance order, par. 64, cited this study when concluding that demand elasticity considerations supported the conclusion that AT&T is nondominant in long-distance.

[24] Quality Strategies, pp. 23-24.

support of the expressions of confidence by CLECs, with which the trade press abounds[25]—a confidence confirmed by a disinterested observer:

> CLECs will be hitting their stride as marketing machines during 1998. ...If 1996 was a year of regulatory maneuvering, and 1997 has been a year of preparation, then 1998 will surely be the first year in which CLECs demonstrate their ability to take market share away in a big way.[26]

The CLEC's ability to take market share from incumbent providers is based, in part, on their offering of sophisticated new services that use these high capacity facilities,[27] bundled into a complete offering of telecommunications services. Incidentally, as this last consideration suggests, the CLECs have one great advantage over RBOCs like U S WEST, so long as the latter companies continue to be subject to the prohibition of their offering inter-LATA services, a restriction from which the CLECs are of course free.

3. Supply Elasticity

The analysis of supply elasticity involves an appraisal of (1) the capability of current competitors that are considered nondominant to expand operations to absorb demand currently served by the incumbent carrier and (2) the presence or absence of entry barriers.[28]

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[25] For example, the CEO of Intermedia boasted that "CLECs have proven they can easily take market share from incumbents." *Telco Business Report*, December 8, 1997, pp. 1-3.

[26] *Ibid.*

[27] For example, e spire (formerly ASCI), a CLEC operating in the southeastern United States, recently announced a high capacity product, targeted to small to medium business, which in the words of one of its executives is "the [RBOCs] worst product nightmare." *Telephony*, March 30, 1998, p. 7. While e spire is not operating in Phoenix, the types of products that will be successful in the market are likely to be similar across regions. Successful introduction of a new product by a CLEC in one region can be expected to be imitated by other CLECs in other regions.

[28] AT&T nondominance order, par. 57. The FCC focused on the first of these in its decision, apparently because it considered the capacity of the existing competitors alone sufficient.

a. Ability of existing CLECs to expand

The best indicator of the ability of existing CLECs to expand is the fact that they have in fact done so tremendously, both in Phoenix, as we have already described, and nationwide, as we will describe in the next section. The market itself has demonstrated that it is indeed economically feasible for these firms to capture demand, both new volumes and demand currently served by U S WEST, if that Company's performance failed to meet competitive standards.

The question: if customers wanted to shift from U S WEST in response to a price increase, would existing CLECs find it economical to serve them?—can also be answered hypothetically. The studies performed by Quality Strategies and PEI provide two measures that shed light on the subject. First, Quality Strategies estimated that the existing backbone networks of the five facilities-based Phoenix CLECs have more than *ten times* the capacity needed to accommodate the current demand for U S WEST's high capacity services.[29] Further editorial commentary on the significance of this finding for the question of U S WEST's "dominance" would surely be superfluous.

Of course, customers would have to be linked to one or another of those backbone networks if a CLEC were to serve them. To this end, PEI performed a detailed study of the cost of providing that linkage to U S WEST's customers, at successive distances from the CLEC facilities.[30] It revealed that about one-half of U S WEST's high capacity customer

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[29] Quality Strategies, p. 29.

[30] The cost model developed by PEI is described in detail in its report: it identified routes between customers and the CLEC networks and then estimated the cost of providing fiber optic cable, the associated support structures and electronics over them.

locations are within 1,000 feet (under 0.2 miles) of a CLEC network and to make such connections to all these customers would require an investment of $45 million and would take no more than two years. To serve all locations within 9,000 feet of CLEC networks would require a total of $127 million and no more than five years.

To put these estimates into perspective, we observe that U S WEST's present high capacity customers generate about $50 million of revenue annually in direct charges for the high-capacity facilities—in effect, for the "dial tone" alone. This means that the investment necessary to capture all that current business would be about 2.7 times revenues—a multiple markedly lower than U S WEST's present investment to revenue multiple of 3.2 for Arizona.[31] Under plausible assumptions, the investment ratios required for CLECs to reach customers located within 1,000 feet of their present networks would be even more favorable.[32]

Of course, these investment to revenue comparisons must be viewed in the context of the hypothetical exercise associated with this attempt to assess supply elasticity: would existing CLECs find it economic to expand to serve existing demand if it were to become available. In reality, these CLECs would most likely expand selectively, in an attempt to target high volume/low cost locations. On the one hand, such targeting could introduce some diseconomies, because it would involve serving less than the total volume considered in PEI's calculations, and thereby sacrifice some economies of scale and density.[33] For example, if

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[31] ARMIS data disclose investment (total plant in service) of about $4.31 billion and revenues of about $1.35 billion in 1996.

[32] Almost half of U S West's locations are within 1,000 feet of CLEC backbone networks. These locations account for approximately 86 percent of U S West's high-capacity business (i.e., in terms of DS1 equivalents).

[33] In particular, PEI's study implies three types of scale economies. First, there are cost savings when support structures such as poles and trenches can be shared among several locations. Second, the fiber cable itself is a

CLECs captured only one-half of the volumes at U S WEST's existing locations, the investment to cost ratio for locations within 1,000 feet would be 3.1.[34]

On the other hand, focusing on scale economies sacrificed by targeting customers can only understate the attractiveness of CLECs serving current U S WEST locations, for two reasons. First, because the high capacity market is growing, there will be economies of scale in serving both demand captured from U S WEST and the incremental demand. Second, it is important to recognize that the foregoing revenue figures are the payments by subscribers for the use of the high-capacity facilities only: they are equivalent to the flat monthly fee for "dial tone" service alone. As such, they do not account for the fact that competition is increasingly over a package of services: access to a customer becomes the vehicle for selling services with even higher margins. Taking these net revenues into account would make the comparison of the required investment in high capacity facilities to the revenues it would produce markedly more favorable than is suggested by our previous calculations.

The timeliness with which current competitors can expand their facilities to meet new demand is also important in assessing supply elasticity. In this connection, the estimate that CLECs can serve the 50 percent of current U S WEST-served locations that are within 1,000 feet of CLEC networks in 18 to 24 months is very significant. This two year horizon is consistent with the time frame envisioned in the *Merger Guidelines* in determining whether

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fixed cost for each location, because the same fiber can serve all volumes in the relevant range. Third, there are economies of scale in the electronics, i.e., electronic costs increase less than proportionately as additional volume is added at a location.

[34] We chose the 50 percent assumption on the basis of the observation that CLECs are now capturing about one-half of new volumes. Our ratio assumes that their share would be spread evenly over all locations, so that CLECs would still have to build facilities to all of them.

prospective new investments should be counted as a competitive factor disciplining the pricing behavior of firms contemplating a merger.[35]

Even though taking on customers beyond 1,000 feet would require additional time, the CLECs' ability to do so is competitively significant. As the FCC correctly observed in its AT&T nondominance order,

> The issue, however, is not whether Sprint and MCI could and should expand their networks so they can serve all of AT&T's customers within a short time frame. Rather, the issue is whether, in the short term, Sprint and MCI have sufficient available excess capacity to add a significant number of new customers. The evidence shows that Sprint and MCI can add significant numbers of new customers with their existing capacity and add incrementally to this capacity as new customers are added to their networks.[36]

b. Barriers to entry

The impressive growth of CLECs demonstrates that barriers to local exchange entry are obviously not prohibitive.[37] Although high capacity entry came later to Phoenix than other metropolitan areas, CLECs there appear to be catching up to the pace elsewhere. According to Quality Strategies, two CLECs entered in 1994 (ELI and TCG), MFS in 1995, MCI in 1996, and GST in 1997.[38]

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[35] *Merger Guidelines*, par. 3.2.

[36] Par. 60. The FCC also concluded that resellers could expand capacity in response to supracompetitive pricing by AT&T (par. 62)

[37] Although much of the available data on CLEC growth is at the national level and for all local exchange services, it is clear that these firms are focusing on high capacity services. For example, Heather Gold reported that the CLECs had created "the nation's first digital local networks...in direct response to increased customer needs for broadband capabilities and advanced telecommunications solutions," *op. cit.*

[38] Quality Strategies, pp. 19-22 and p. 25.

Nationally, there has been tremendous growth in the number and size of CLECs. Currently, there are over 100 of them[39] and they are adding customers at an impressive rate. For example, Salomon Smith Barney reported that CLECs added 75,000 new business lines in the fourth quarter of 1996—sixty-four percent of that total by the "Big 2" (TCG and MFS), 20 percent by 12 other smaller, explicitly identified carriers, and the other 16 percent by an unidentified group. By the first quarter of 1998, the total CLEC volume of new lines had increased to about 500,000, with the "Big 2" accounting for only one-third, the next 12 for 50 percent, and the remaining small LECs for the remaining one-sixth[40]—testifying to a marked decrease in concentration even among these challengers of the ILECs. Clearly, the market opportunities for CLECs are not only expanding but expanding disproportionately rapidly for the newer entrants among them.

Similarly, CLECs are having no trouble attracting large amounts of capital. These funds have come both from other carriers in the form of acquisitions and from the capital market. For example, over the past two years, WorldCom acquired two CLECs, MFS and Brooks, for a combined price of $16.4 billion—an amount almost identical to what SBC paid to acquire Pacific Telesis. In the first half of this year alone, AT&T has acquired TCG at a cost of $11 billion and recently announced its intent to acquire TCI at a cost of $48 billion. In the two years since the passage of the Telecommunications Act in 1966, CLECs have raised $14 billion

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[39] Heather Gold, *op. cit.*

[40] Salomon Smith Barney, *op. cit.*

of outside capital.[41] In comparison, The most recent data reported to the FCC show total annual investment by the ILECs has been about $18 billion.[42]

In addition, the availability of investment capital has been unequivocally demonstrated. The over $14 billion that CLECs have raised since the passage of the 1966 Act—over a period of less than two years—was six times the amount of capital raised in the four years before its passage.[43]

4. Cost Structure

In the AT&T nondominance order, the FCC was concerned that AT&T's size relative to other carriers might give it a significant advantage in terms of scale economies and access to capital. The same question must be raised in the present context. The record we have already summarized supplies the definitive answer: investors are obviously satisfied that incumbents do not enjoy advantages sufficient to make continuing—indeed growing—investment in CLECs unattractive.

What is both highly satisfying from the standpoint of consumers and reassuring about the continued feasibility and vitality of competitive entry is the fact that this rapid recent expansion of the CLECs has occurred at the same time as the charges by incumbents for high capacity services have declined substantially. When the first CLECs entered in the mid- to late 1980s, these prices were over twice their current levels.[44] That CLEC activity is accelerating at

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[41] Statement of Heather Gold, *op. cit.*

[42] Calculated from data reported in the FCC's *Statistics of Communications Common Carriers.*

[43] Heather Gold, *op. cit.*

[44] For example, U S WEST's rates for DS-1 capacity fell by 43 percent between the end of 1989 and the beginning of 1998.

lower price levels is strong indication that investors are not overly concerned about insurmountable cost advantages of the incumbents.

III. THE COST OF MAINTAINING DOMINANT REGULATION OF U S WEST'S HIGH CAPACITY SERVICES

In the AT&T nondominance order (e.g., par. 32), the FCC describes graphically the large social costs of continued asymmetrical regulation: (1) the longer tariff notices imposed on AT&T dampened its incentives to innovate, because rivals could respond to its innovations even before it could actually offer them; (2) these same filing requirements also dampened the regulated company's incentives to reduce prices; (3) the dominant firm's competitors could use the asymmetrical regulatory process to delay and undermine its initiatives; and (4) regulation imposed administrative costs on both the regulated firm and the FCC.

The dominant firm regulation at issue in these proceedings involves the same kinds of costs—if anything, they are compounded by the fact that CLECs are providing complete bundles of services, including interLATA, while the ILECs cannot respond until such time as their 271 applications are successful. Ironically, these applications are being held up pending demonstration that ILEC local markets are sufficiently open to competition!

The upgrading and modernization of the switched public network and the fullest exploitation of its capability of offering a variety of sophisticated and innovative services—which are the central goals of the Telecommunications Act of 1996—depend not just on freeing the telephone companies and all others from restrictions and handicaps on their ability to do so; it also requires offering all parties the full, undiluted incentives of a free market system to undertake the requisite, typically risky investments.

Those incentives are of two kinds. The first is the stimulus of competition itself. The strongest case for substituting the discipline of competition for that of regulation is the superior ability of the former to exert pressures on all producers to be efficient and innovative, if they are to survive, let alone prosper. Outstanding, unequivocal illustrations are the wholesale adoption of hub and spoke operations and the development of computerized reservations systems by the airlines after their deregulation, and the widespread adoption of just-in-time inventory systems made possible only by the freedom of truckers, conferred by their deregulation, to enter into binding contracts with penalties for failure to perform according to stipulated standards.

The second is the self-interest of the telephone companies, freed from continuing restrictions on the services they are permitted to offer. If they are to undertake the risks of investments in innovation, they must see the prospect of retaining the profits of the ones that turn out successfully, symmetrically with their bearing the full costs of the failures. This requires genuine deregulation.

Particularly during the next several years, when competitors in markets formerly protected by regulation will attempt to enter each other's domains in innovative and even unpredictable ways, it is essential that we not weaken the second of these incentives in a misguided effort to strengthen the first. Attempts to micromanage the process of deregulation, we have found in other industries, are more likely to produce distortions than actually to encourage efficient competition.[45] Ultimately, both incentive systems require the shrinking of

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[45] Alfred E. Kahn, "Applications of Economics to an Imperfect World," the Richard T. Ely lecture, *The American Economic Review, Papers and Proceedings*, Vol. 69, No. 2, May 1979, pp. 1-13.

regulation and of all such regulatory restrictions to the absolute minimum and entrusting protection of the public to deregulated competition—subject, as always, to the constraints of the antitrust laws.[46]

IV. CONCLUSIONS

Following the approach the FCC has previously used to assess market power for other services, we have concluded that the market for high capacity services in the Phoenix area fully exhibits its stipulated indicia of competition. In particular, (1) US WEST has a diminishing market share—indeed, it serves only 30 percent of the retail market— and is barely providing one-half of the facilities that serve new demand; (2) customers are highly sensitive to price and other dimensions of service; (3) US WEST's existing competitors can readily expand their capacity sufficiently to displace it entirely, if it were to attempt to price monopolistically, and, in addition, barriers to entry are minimal; and (4) U S WEST's size gives it no insurmountable advantage.

Indeed, these indicia show intensifying competition, which strongly suggests that if the FCC grants U S WEST's Petition, there is virtually no likelihood that it will ever regain a dominant position that would call for reregulating its high capacity services. On the contrary, the relevant historical precedents indicate that regulators have little to fear from premature relaxation of regulation in these markets. For example, AT&T's market share has continued to decline since it obtained nondominant status in late 1995.[47]

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[46] See Kahn, *Letting Go: Deregulating the Process of Deregulation*, Michigan State University Institute of Public Utilities, 1998.

[47] Federal Communications Commission, *Trends in Telephone Service*, February 1998.

US WEST's lack of market power signifies that competition itself, without dominant firm regulation, is sufficient to restrain the Company's ability to impose anticompetitive prices and other conditions. In light of these developments, the costs of maintaining dominant firm regulation in this market clearly exceed whatever benefits continued regulation could possibly confer.

ALFRED E. KAHN

Alfred E. Kahn is the Robert Julius Thorne Professor of Political Economy, Emeritus, Cornell University and a Special Consultant to National Economic Research Associates, Inc. (NERA).

He has been Chairman of the New York Public Service Commission; Chairman of the Civil Aeronautics Board; and Advisor to the President (Carter) on Inflation and Chairman of the Council on Wage and Price Stability.

He received his Bachelor's and Master's degrees from New York University and a Doctorate in Economics from Yale University. Following service in the Army, he served as Chairman of the Department of Economics at Ripon College, Wisconsin. He moved to the Department of Economics at Cornell University, where he remained until he took leave to assume the Chairmanship of the New York Public Service Commission. During his tenure at Cornell, Professor Kahn served as Chairman of the Department of Economics, member of the Board of Trustees of the University and Dean of the College of Arts and Sciences.

Throughout his career, he has served on a variety of public and private boards and commissions including: the Attorney General's National Committee to Study the Antitrust Laws; the senior staff of the President's Council of Economic Advisors; the Economic Advisory Council of American Telephone & Telegraph Company; the National Academy of Sciences Advisory Review Committee on Sulfur Dioxide Emissions; the Environmental Advisory Committee of the Federal Energy Administration; the Public Advisory Board of the Electric Power Research Institute; the Board of Directors of the New York State Energy Research and Development Authority; the Executive Committee of the National Association of Regulatory Utility Commissioners; the National Commission for Review of Antitrust Laws and Procedures; the New York State Council on Fiscal and Economic Priorities; the Governor of New York's Fact-Finding Panel on Long Island Lighting Company's Nuclear Power Plant at Shoreham, L.I.; the Governor of New York's Advisory Committee on Public Power for Long Island; the National Governing Board of Common Cause; and, in 1990, as Chairman of the International Institute for Applied Systems Analysis Advisory Committee on Price Reform and Competition in the USSR.

He has also served as a court-appointed expert in State of New York v. Kraft General Foods, Inc., et al., U.S. Disctrict Court, S.D.N.Y.; Advisor to New York Governor Carey on Telecommunications Policy; and as a consultant to the Attorneys General of New York, Pennsylvania and Illinois, the Ford Foundation, the National Commission on Food Marketing, Federal Trade Commission, Antitrust Division of the Department of Justice, the U.S. Department of Agriculture and the City of Denver on charging and financing of Stapleton Airport.

He has received L.L.D. honorary degrees from Colby College, Ripon College, Northwestern University, the University of Massachusetts and Colgate University, and an honorary D.H.L. from the State University of New York, Albany; he also received the Distinguished Transportation Research Award of the Transportation Board Forum, The Alumni Achievement Award of New York University, the award of the American Economic Association's Transportation and Public Utilities Group for Outstanding Contributions to Scholarship, The Henry Edward Salzberg Honorary Award from Syracuse University for Outstanding Achievement in the Field of Transportation, the Burton Gordon Feldman Award for Distinguished Public Service from Brandeis University, the Wilbur Cross Medal for outstanding achievement (Yale University), The 1997 L. Welch Pogue Award For Lifetime Contributions to Aviation and the 1997 Sovereign Fund Award Honoring Vision, Commitment and Achievement in the Pursuit of Individual Freedom; and was elected to membership in the American Academy of Arts and Sciences and Vice President of the American Economic Association. He has been a regular commentator on PBS's "The Nightly Business Report."

He has testified before many U.S. Senate and House Committees, the Federal Power Commission, the Federal Energy Regulatory Commission and numerous state regulatory bodies.

His publications include *Great Britain in the World Economy; Fair Competition: The Law and Economics of Antitrust Policy* (co-authored); *Integration and Competition in the Petroleum Industry* (co-authored); *The Economics of Regulation*; and *Letting Go: Deregulating the Process of Deregulation.* He has written numerous articles which have appeared in *The American Economic Review, The Quarterly Journal of Economics, The Journal of Political Economy, Harvard Law Review, Yale Journal on Regulation, Yale Law Journal, Fortune, The Antitrust Bulletin* and *The Economist*, among others.

Please address all communication to:
Alfred E. Kahn
308 N. Cayuga Street
Ithaca, NY 14850
Tel: 607-277-3007
Fax: 607-277-1581
e-mail: alfred.kahn@nera.com or aek8@cornell.edu

TIMOTHY J. TARDIFF

Timothy J. Tardiff is a Vice President in the Cambridge, Massachusetts office of National Economic Research Associates, Inc. (NERA), where he specializes in the economics of the telecommunications industry.

Dr. Tardiff received a B.S. with honors in Mathematics from the California Institute of Technology in Pasadena and a Ph.D. degree in Social Science from the University of California, Irvine, under a National Science Foundation Pre-doctoral Fellowship and an NSF Grant for Improving Dissertation Research in the Social Sciences.

Dr. Tardiff joined the faculties of the Department of Civil Engineering and the Division of Environmental Studies at the University of California, Davis. He taught undergraduate and graduate level courses in transportation and environmental policy analysis. His research included applications of econometric models of consumer choice to transportation planning problems. Dr. Tardiff's research was funded by the National Science Foundation, the Institute of Transportation Studies and the California Department of Transportation.

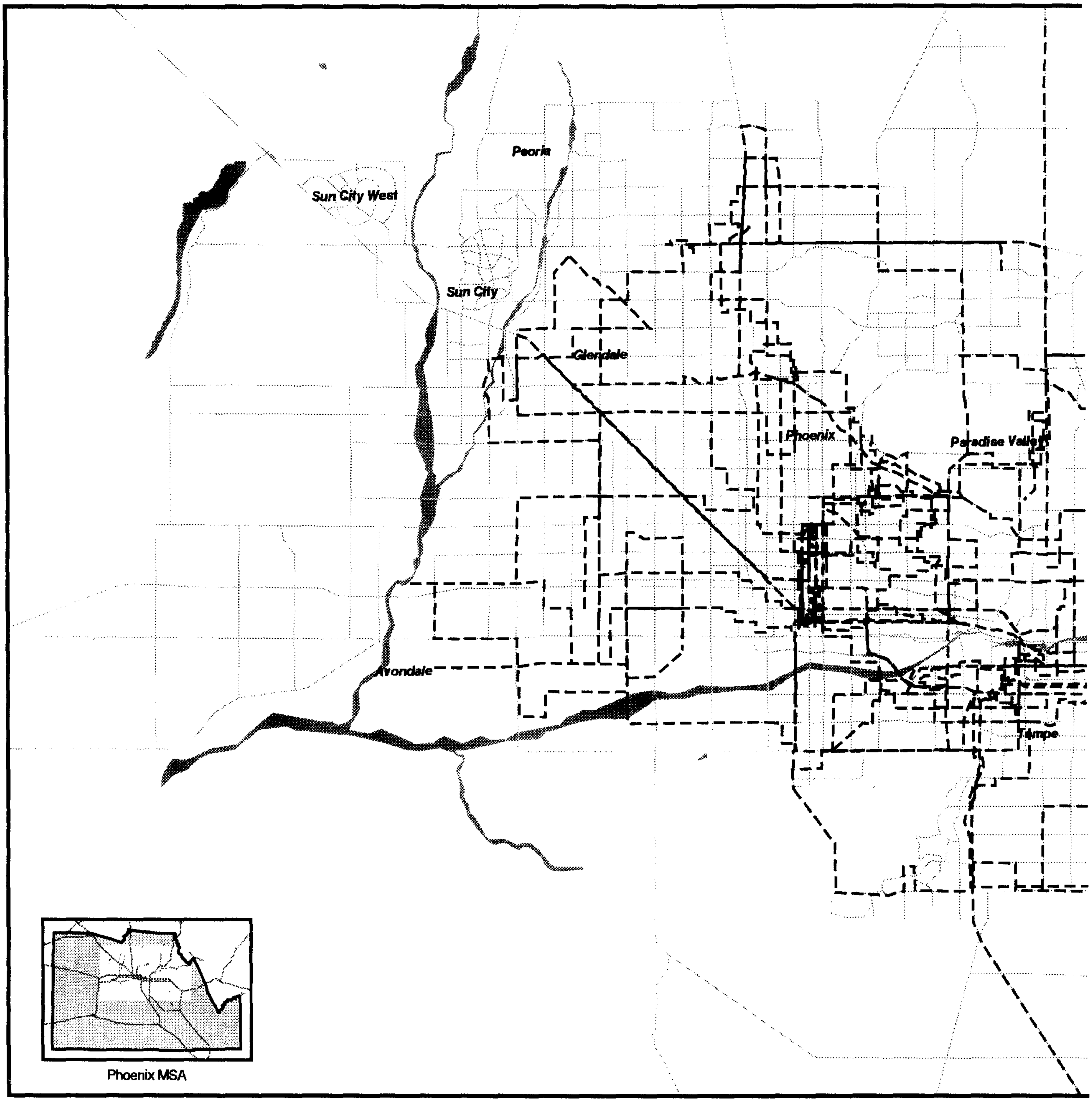
Prior to joining NERA, Dr. Tardiff's work included transportation, energy, public utility and telephone industry projects for the U.S. Departments of Transportation and Energy, the California Energy Commission, and several telephone and electric utilities.

Since joining NERA, he has evaluated pricing policies for increasingly competitive telecommunications markets, including appropriate mechanisms for pricing access services to competitors; studied actual and potential competition for services provided by telephone operating companies; analyzed the demand and revenue impacts of new telephone rate structures; developed and evaluated damage studies used in major telecommunications antitrust actions; analyzed the market potential for wireless telephone services; evaluated the investment and marketing programs of telephone companies; and developed approaches for measuring incremental costs of telecommunications. Most recently, he has submitted affidavits, reports and testimony in federal and state regulatory proceedings on the implementation of the Telecommunications Act of 1996: including pricing of unbundled elements, universal service reform, carrier access pricing reform, and interLATA entry.

Dr. Tardiff has published extensively in the transportation literature. He has also presented and published papers on the telecommunications industry, which have appeared in publications such as the *American Economic Review*, *Information Economics and Policy*, and as chapters in several books. These papers address the issues of pricing and costing policies for emerging competition in telecommunications markets; evaluating and forecasting the impacts of telephone rate plans such as local measured service; analyzing the markets for new telecommunications products and services; and the development of competition for local exchange services.

Please address all communication to:
Timothy J. Tardiff
National Economic Research Associates
One Main Street, 5th Floor
Cambridge, MA 02142
Tel: 617-621-2614
Fax: 617-621-0336
e-mail: timothy.tardiff@nera.com

ATTACHMENT D



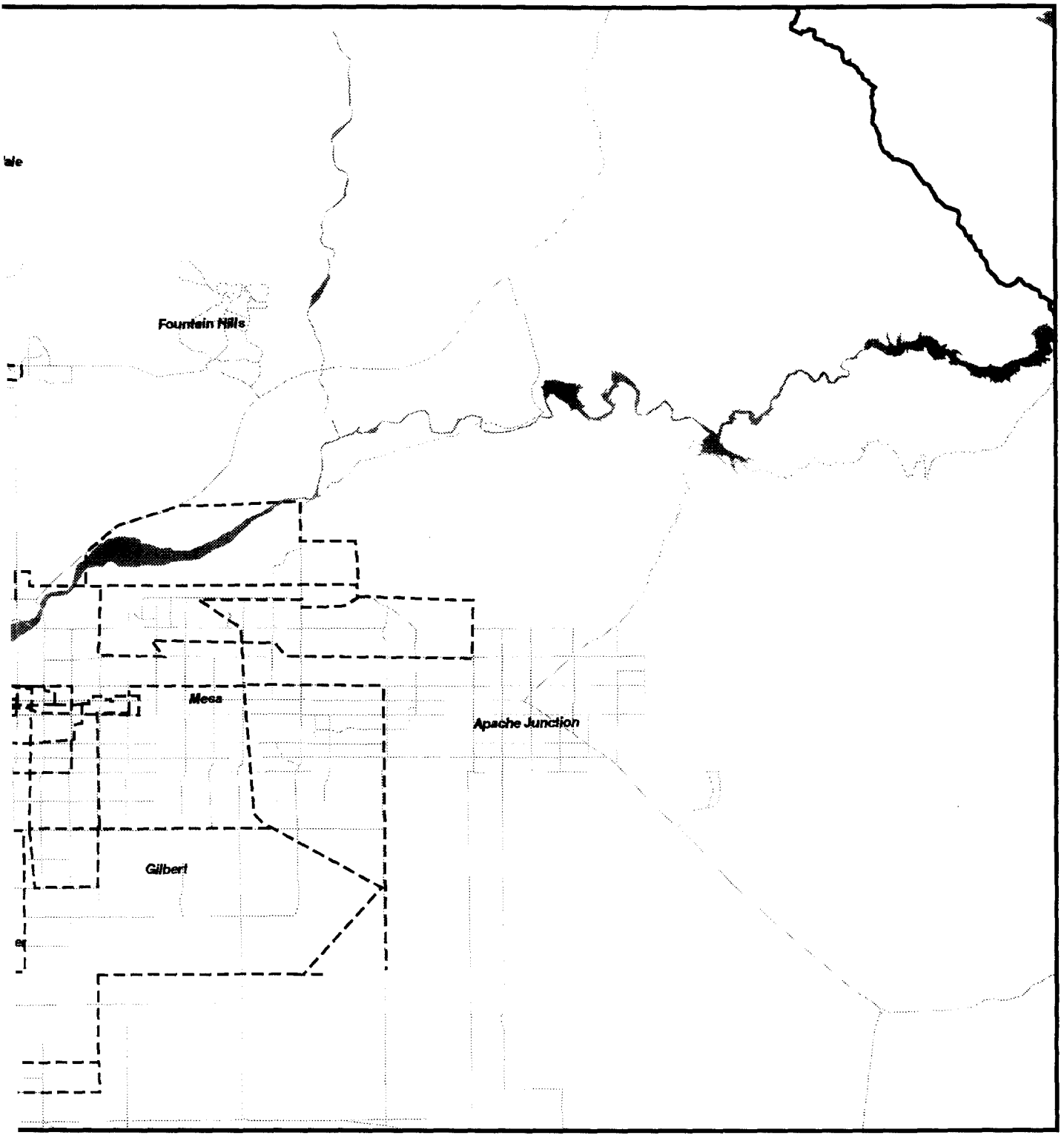
Notes :
1. Sources : Quaility Strategies and U S WEST Customer Billing Records.
2. 86% of the U S WEST DS1 Equivalent Services are within 1000 FT of Competitive Provider Coverage.

Legend

- - - - Competitive Access Provider Fiber

Major Roa

August 12, 1998
phxmap.eps



N

1 inch = 5 miles

U S WEST M M A I G D I S C

Competitive Provider Coverage of U S WEST DS1 Equivalent Services

U S WEST